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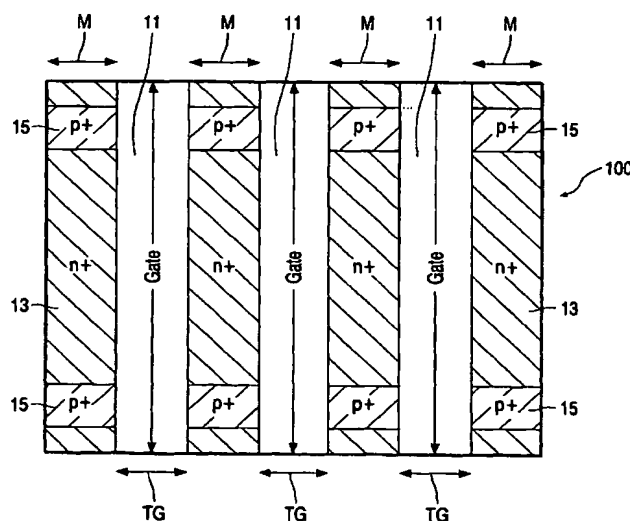
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(54) Title: TRENCH-GATE SEMICONDUCTOR DEVICES



(57) Abstract: A trench-gate vertical power transistor in which the trench-gates (11) are parallel stripes which extend across the active area (100). Source regions (13) and ruggedness regions (15) extend to a source contact surface as alternating stripe areas having a width perpendicular to and fully between each two adjacent parallel stripe trench-gates (11). The ruggedness regions (15) are more heavily doped than the source regions and this enables an increased length of the source regions with a consequent reduction in specific resistance of the transistor. For example, the mesa width (13,15) and the trench-gate (11) width may both be about 0.4 μ m, the ruggedness region (15) length may be about 1 μ m and the source region (13) length may be about 20 μ m. The doping concentration of the p type ruggedness regions (15) may be approximately 10 times greater than the doping concentration of the n type regions (13), for example about 10₂₁ cm.⁻³ and about 10₂₀ cm.⁻³ respectively.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01L29/78 H01L29/10 H01L29/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 072 266 A (BULUCEA C ET AL) 10 December 1991 (1991-12-10) cited in the application column 3, line 63 -column 4, line 27; figures 2A, 3A-3B ---	1
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A	EP 0 199 293 A (GEN ELECTRIC) 29 October 1986 (1986-10-29) abstract; figures 1-5 -----	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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